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IN RE APPLICATION OF: :

ISAMU YAMAGUCHI, ET AL : EXAMINER: RAJGURU, U. K.

SERIAL NO.: 10/067,944 :

FILED: FEBRUARY 8, 2002 : GROUP ART UNIT: 1711

FOR: RESIN COMPOSITIONS AND MOLDED PRODUCTS MAKING USE OF THE SAME

DECLARATION UNDER 37 C.F. R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Now comes ISAMU YAMAGUCHI and states:

1. That I am a graduate of Graduate School of Science and Technology, Nihon University at Tokyo, Japan, and received my master degree in the year 1974.

2. That I have been employed by Dainichiseika Color & Chemicals Mfg. Co., Ltd. for 30 years as a researcher in the field of the industrial chemistry.

3. That I understand the English language or, at least, that the contents of the Declaration were made clear to me prior to executing the same.

4. That the following experiments were carried out by me or under my direct supervision and control.

5. The following experiments demonstrate the comparison of the heat discoloration resistance and weather-ability of products (test pieces) molded using the resin composition comprising a matrix resin and short cellulosic fibers dyed with a threne dye according to the

present invention with those of comparative test pieces molded using the resin compositions comprising the same matrix resin as above and short cellulosic fibers dyed with a comparative dye (a direct dye or a reactive dye) in stead of the above threne dye. The experiments described herein all were performed by the methods disclosed in this present application.

6. The preparation of the test pieces according to the present invention

The test pieces were prepared using short viscose rayon fibers dyed with a threne dye, C.I. Vat Red 10, in a dye concentration of 13% according to the method disclosed in the Example 1 of the specification of the present application:

(1) The dyed short viscose rayon fibers according to the present invention

Undyed short viscose rayon fibers of 3.3 decitex and 0.5 mm in average length were produced. A portion of those short fibers was dyed to equilibrium in a known manner for direct dyeing (an IN method having hydrosulfite of 3 g/L and a dyeing temperature of 55 ℃) by using C.I. Vat Red 10 in an amount that the dye amounted to 13%, based on the corresponding portions of the short fibers (hereinafter called "dye concentration"). A dyed short viscose rayon fiber sample was obtained accordingly.

(2) The resin composition according to the present invention (Claim 1)

The obtained dyed short fiber sample (12.0 parts) was mixed in a tumbler with polypropylene (28.3 parts), linear low-density polyethylene (28.3 parts), an ethylene-propylene elastomer ("TAFMER A=4085", trade name; product of Mitsui Petrochemical Industries, Ltd.; 20.0 parts), a maleic-anhydride-modified product of polypropylene ("POLYBOND 3150", trade name; product of Shiraishi Calcium Kaisha, Ltd.; 3.0 parts), a white pigment (6.3 parts) as an added color, a dispersant of the metal stearate soap type (1.7 parts), an antistatic agent of the stearic monoglyceride type (0.3 part), and an antioxidant of the hydroxyphenyl propionate type (0.1 part); the added white pigment as

used above was a toned pigment prepared by adding red iron oxide, a calcined yellow pigment and carbon black to titanium oxide.

(3) The master batch according to the present invention (Claim 5)

The thus-obtained molding resin composition was extruded into strands by an extruder., the strands were pelletized using a pelletizer; the master batch was obtained.

(4) The molding resin composition according to the present invention (Claim 9)

The obtained master batch (5 parts) were blended with an uncolored resin (100 parts; being composed of 65% of polypropylene, 16% of an ethylene-propylene elastomer , and talc).

(5) The molded products (test pieces) according to the present invention (Claim 11)

The resultant resin blend was subjected to injection molding by using an injection molding machine with the conditions of a molding temperature of 240℃, an intra-cylinder residence time of 30 minutes and continuous molding; the test pieces of the present invention were obtained.

7. The preparation of the test pieces in the comparative examples

The comparative test pieces were prepared in a method similar to the above method except for using a known method for direct dyeing using a direct dye, C.I. Direct Red 31, or a reactive dye, C.I. Reactive Red 2, in stead of the above threne dye. In the method for dyeing the short viscose rayon fibers by using the direct dye, the bath solution for dyeing using the direct dye contained the direct dye, sodium mono-hydrogen phosphate and water: the dyeing was performed at 70 ℃. In the dyeing method using the reactive dye, the short viscose rayon fibers were dyed with the reactive dye at a liquor ratio of 50:1 in the presence of 5 wt. % of sodium chloride. Dyeing began at room temperature; the temperature is elevated to 70 ℃, and then a 2 wt.% sodium carbonate was added to the bath; and the dyeing continued for 60 minutes at the same temperature.

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8. The method for determining heat discoloration resistance and weatherability

In this determination, 5 test pieces were used in each example; determined values were presented as a mean for 5 test pieces.

(1) Heat discoloration resistance

Color differences ΔE between the standard test pieces, which contained non-dyed short viscose rayon fibers in stead of the dyed, and the other test pieces including the test pieces of the present invention's example and the comparative example were measured by a colorimeter ("SM Color Computer, Model SM-5", trade name; manufactured by SUGA TEST INSTRUMENTS CO., LTD.). Each test piece with a ΔE value of 1 or smaller was rated "A" (passed), each test piece with a ΔE value greater than 1.5 was rated "C" (failed), and each test piece with a ΔE value greater than 1 but not greater than 1.5 was rated "B".

(2) Weatherability

Using a sunshine fadeometer ("FAL-5H Model B", trade name; manufactured by SUGA TEST INSTRUMENTS CO., LTD.), the test pieces were tested at 80℃. Their ΔE values after exposure to light for 1,000 hours were measured (the ΔE values show color differences between before and after the light exposure for the tested test pieces.).

9. The results

(1) The surfaces of the above-obtained test pieces in the present invention's example and the comparative example , said surfaces having been provided with a citron-like, embossed pattern, contained dyed short fibers of a red color distributed in a fine rugged surface of a white color and had external appearances with similar warmth and depth as nonwoven fabric.

(2) The above ranking results are shown in Table 1.

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TABLE 1

Ranked properties	Threne dye	Direct dye	Reactive dye
	C.I. Vat Red 10	C.I. Direct Red 31	C.I. Reactive Red 2
Heat discoloration resistance	A	C	C
Weather ability Δ E	0.55	15.0	14.0

10. Conclusion

As shown in Table 1, the test pieces containing short cellulosic fibers dyed with a threne dye according to the invention is recognized to be much more excellent in the heat discoloration resistance and the weatherability than those containing short fibers dyed with a direct dye or a reactive dye, that is, the resin composition comprising a matrix resin and short cellulosic fibers dyed with a threne dye according to the invention is recognized to be much more excellent than that comprising the same matrix resin as above and short fibers dyed with a direct dye or a reactive dye.

11. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

12. Further deponent saith not.

Isamu Yamaguchi
Signature ISAMU YAMAGUCHI

February 10, 2005
Date February 10, 2005